UNIVERSITY OF JOHANNESBURG

FACULTY OF SCIENCE: BOTANY AND PLANT BIOTECHNOLOGY

LSFT0B1 EXAM (UNIT 1-6)

10 NOVEMBER 2015

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DURATION:	**3 HOURS**
TOTAL MARKS:	**150**

NUMBER OF PAGES: 6 PAGES

Please read the following instructions carefully:

1. Answer all the questions in the question paper.
2. Answer question 1 in CAPITAL LETTERS.
3. ALL of the questions in the test book.
4. Work neatly.
5. Read your questions carefully.
6. Good Luck.

QUESTION 1 **[18]**

Choose the alternative that best completes the statement or answers the question. ***Only write down the correct CAPITAL letter next to the appropriate question number.***

1.1 The throat divides into two (2) separate tubes: the trachea and the esophagus. What prevents food from entering the trachea.

a) The uvula.
b) The tongue.
c) The trachea.
d) The epiglottis.

1.2 What happens when food reaches the stomach?

a) Nothing. No digestions occurs in the stomach.
b) The food moves quickly into the small intestine.
c) Juices mix with the food and the stomach muscles squeeze it.
d) The food is completely digested and is absorbed by tiny blood vessels in the walls of the stomach.

1.3 Where does the partly-digested liquid food go after it leaves the stomach?

a) The esophagus.
b) The appendix.
c) The small intestine.
d) The large intestine.

1.4 Which one (1) of the following occurs in both aerobic and anaerobic respiration?

a) Carbon dioxide is used.
b) Energy is released from food.
c) Carbon dioxide and water are released.
d) Both processes are the reverse of photosynthesis.

1.5 Cellular respiration takes place:

a) during the day in plant cells only.
b) during the day and the night in animal cells only.
c) all the time in both plant and animal cells.
d) all the time in animal cells only.

1.6 The process of respiration in green plants occurs:

a) mainly during the day.
b) mainly during the night.
c) during day and night.
d) only during high humidity.

1.7 Which organ is made up of air-carrying tubes and tiny sacs?

a) The brain.
b) The lungs.
c) The stomach.
d) The diaphragm.

1.8 Air can enter the body and travel to the lungs _____

a) through the oesophagus and gullet.
b) through the windpipe and the pores.
c) through the mouth and the nose.
d) through the nose and the nervous system.

1.9 A large muscle that separates the chest cavity from the abdominal cavity and helps with breathing.

a) Larynx.
b) Trachea.
c) Bronchus.
d) Diaphragm.

1.10 Large communities of organisms that form ecosystems with similar features are referred to as:

a) biospheres.
b) ecosystems.
c) biomes.
d) geographic regions.

1.11 What is the average weather in a particular place over a long period of time called?

a) Habitat.
b) Ecosystem.
c) Biome.
d) Climate.

1.12 The freshwater biome includes all of the following EXCEPT _____.

a) lakes
b) ponds
c) oceans
d) streams

1.13 Classical languages (Latin and ancient Greek) are used for biological nomenclature because:

a) scientists want to confuse people.
b) everybody can speak these languages.
c) biologists around the world can understand what organism the name refers to, regardless of the language they speak.
d) they sound better than modern languages.

1.14 Aristotle was a Greek philosopher who formulated the:

a) binomial nomenclature.
b) two (2) kingdom system.
c) proposed adding a third (3rd) kingdom.
d) proposed adding a forth (4th) domain.

1.15 Robert Whittaker:

a) formulated the two (2) kingdom system.
b) formulated the binomial nomenclature.
c) Expanded the classification system to five (5) kingdoms.
d) Expanded the classification system to three (3) domains.

1.16 What caused the change in the different era's, and periods on the geological timescale?

a) Climate change.
b) Geological time.
c) Increased levels of carbon dioxide.
d) All of the above.

1.17 Geological time scale is divided into different scales namely:

a) Eon
b) Era
c) Epochs
d) All of the above

1.18 The fossilized remains of extinct organisms:

a) provide critical evidence that life has evolved overt time.
b) provide a complete record of evolutionary history.
c) demonstrate that nature never "takes leaps" in hi evolution.
d) occur as frequent, common events.

QUESTION 2 **[18]**

Give the correct biological term for each of the following statements. ***Only write down the correct term next to the appropriate question number on the answer sheet.***

2.1 Type of teeth responsible for tearing food.

2.2 Partially digested food moving down the oesophagus.

2.3 Absorption of water mainly takes place in this part of the digestive system.

2.4 The synthesis of ATP from ADP and 'n phosphate during the hydrogen transfer system in the final stages of cellular respiration.

2.5 The phase of cellular respiration whereby each glucose molecule is turned into two (2) pyruvate molecules.

2.6 A molecule that is broken down during cellular respiration to provide energy in a living cell.

2.7 Bones creating four (4) passages in the nasal cavity.

2.8 Structures that allows the windpipe to remain open.

2.9 The amount of pressure each gas exerts.

2.10 Animals that cannot maintain their own body temperature.

2.11 Animals that maintain a constant body temperature and aren't influenced by the fluctuations of the environmental temperature. But some of these animals hibernate during the cold winter months because food is scares.

2.12 The process during which some flowers open in high light intensity and some close in high light intensity.

2.13 The highest taxonomic rank of organisms and which is placed above a kingdom.

2.15 Organisms in which the cells do not have a true nucleus, for example bacteria.

2.16 The study of fossil records to discover the history of life, ancient climates and environments.

2.17 Origins of the earliest forms of life in southern Africa.

2.18 Provides a system of chronologic measurement relating to time that is used by earth scientist's e.g. geologists to describe the timing and relationships between events that have occurred during the history of the earth.

QUESTION 3 **[12]**

Provide a short definition for each of the following:

3.1 Gastrin.

3.2 Chym.

3.3 Lactic acid fermentation.

3.4 Mitochondrion.

3.5 Pulmonary fibrosis.

3.6 Medulla Oblongata.

3.7 Phrenic nerve.

3.8 Spyrometer.

3.9 Biotic organisms.

3.10 Ecosystem.

3.11 Biodiversity.

3.12 Biodegradable.

QUESTION 4 **[19]**

4.1.1 In which of the three (3) parts of the small intestine does the bulk of absorption take place? (2)

4.1.2 How is the sections mentioned in 4.1.1 adapted for its function? (4)

4.1.3 Discuss the method of fat absorption from the sections mentioned in 4.1.1. (6 x ½ = 3)

4.2 Which of the following macromolecules (carbohydrates, fats and proteins) have already been digested by an enzyme when it reaches the pylorus. (6 x ½ = 3)

4.3.1 What is the substance produced in the liver that acts in the small intestine during digestion? (1)

4.3.2 How does that substance help with the digestive process? 6 x ½ = 3)

4.4.1 Besides the liver, which is the other assisting organ of the digestive system that secretes substances into the small intestine? (½)

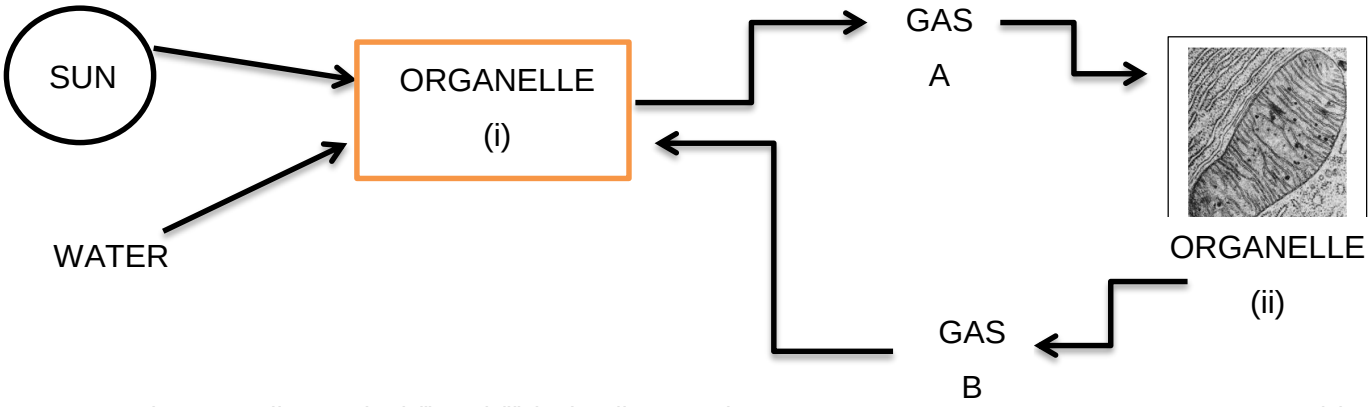
4.4.2 How does the substance secreted by this organ participate in the digestion process? (5 x ½ = 2½)

QUESTION 5 **[17]**

5.1 Provide the diagrammatic representation of the second phase of cellular respiration. (15 x ½ = 7½)

5.2 Name the two (2) other phases that respiration consists of. (2)

5.3 Two (2) organelles in the green parts of plants are responsible for different but closely related processes. Study the diagram below and then answer the questions that follow.



5.3.1 Name the organelles marked (i) and (ii) in the diagram above. (2)

5.3.2 Name the gases indicated by (A) and (B) in the diagram above. (2)

5.3.3 Name the processes that takes place in organelle (i) and organelle (ii) respectively. (2)

5.3.4 How many end product molecules will be formed during the process in organelle (ii)? (1)

5.3.5 What type of liquid is formed during the last phase of the process taking place in organelle (ii)? (½)

QUESTION 6 **[17]**

6.1 Write down the letter of the description in column B that fits the term in Column A. (6)

Column A	Column B
6.1.1 Haemoglobin.	a. Movement of air into and out of the lungs.
6.1.2 Tissue fluid.	b. Separating the thoracic cavity from abdomnal cavity.
6.1.3 Ventilation.	c. Transports oxygenated blood.
6.1.4 Pulmonary artery.	d. Tube strengthened by O-shaped cartilaginous rings.
6.1.5 Bronchus.	e. Muscles between ribs.
6.1.6 Diaphragm.	f. Liquid surrounding body cells.
	g. Tube strengthened by C-shaped cartilaginous rings.
	h. Pigment transporting both O_2 and CO_2
	i. Transports blood rich in carbon dioxide.

6.2 Discuss the process of external respiration. (5)

6.3 Discuss the following three (3) respiratory tract disorders. (3)

6.3.1 Pulmonary fibrosis.

6.3.2 Emphysema.

6.3.3 Asthma.

6.4 List the names and molecular formulas for the two (2) molecules that forms when carbon dioxide is transported in the blood of vertebrates. (3)

QUESTION 7 **[17]**

7.1 Distinguish between autotrophic beings and heterotrophic beings? (2)

7.2 How is energy transferred along a food chain? (2)

7.3 What do energy pyramids represent? (2)

7.4 What are deciduous trees and how does the tree benefit from this? (3)

7.5 Name the adaptations of animals to temperature changes you have studied. (3)

7.6 Discuss the Grassland biome according to annual rainfall, plant –animal species present and average temperature. (5)

QUESTION 8 **[15]**

8.1 The following names of some southern African organism are correctly spelt. However, some of the names have mistakes in the way that they are written.

8.1.1 Decide which names need to be rewritten to follow the correct pattern of the binomial system.
Write down only the correctly written name next to the original wrong name.
(4)

Bubo capensis
ASIO Capensis
Tyto capensis
Buhrinus Capensis
Mehelya capensis
Thelotornis CAPENSIS
Oleo capensis
Alsophila Capensis

8.1.2 Why are the names you have chosen correct? (3)

8.2 Write down an example of each of the following terms. (5)

8.2.1 Monera
8.2.2 Plantae
8.2.3 Protista
8.2.4 Anamalia
8.2.5 Fungi

8.3 List the three (3) domains that organisms are divided into. (3)

QUESTION 9 **[17]**

9.1 Identify the different scales that the Geological time scale is divided into. (4)

9.2 Each era on the scale is separated from the next by: (2)

9.3.1 Discuss absolute radioactive dating of fossils. (4)

9.3.2 Name one (1) other process that could be used to determine the date of fossils. (1)

9.4 Scientists use the results from fossil dating to make inferences about the age of a fossil.
Name two (2) reasons why we need to know the age of a fossil. (2)

9.5 Discuss Sterkfontein's first piece de resistance: the *Australopithecus africanus* (4)